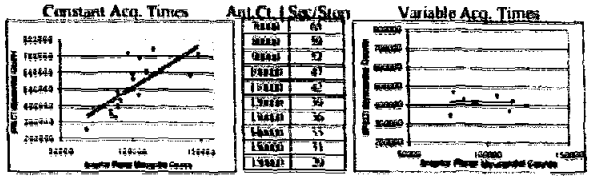
counts in a planar view to scale the acquisition times of SPECT to improve the consistency of myocardial count density.

*Methods:* This study was performed on a 90° dual head, ADAC Cardio system using Tl-201 for planar myocardial perfusion imaging followed by SPECT. A calibration table for the camera was derived from 20 normal patients by measuring the relationship between the myocardial counts in a 4 minute anterior view and the myocardial counts in a standard SPECT acquisition (45 seconds/stop, 16 stops/head). The correlation between these quantities defined a correction table for adjusting the acquisition times of SPECT studies to optimize myocardial counts for that camera.

*Results:* There was a good correlation between these quantities ($r = 0.77$). The resulting calibration table was used to correct the acquisition times.




Using this table to adjust the acquisition time, we observed a drop in the variability of SPECT myocardial counts from ±30% using constant acquisition times to ±9% using variable acquisition times.

*Conclusion:* Measurements of SPECT myocardial counts correlate well ($R = 0.77$) with myocardial counts in the anterior view. This information, when used to adjust SPECT acquisition times reduced myocardial count variability from 30% to 9% and improved image consistency.

5:00

## 824-5 Accuracy of Gated SPECT Thallium Left Ventricular Volumes and Ejection Fractions: Comparison With Three-dimensional Echocardiography

O.O. Akinboboye, L.E.-K. Coffin, R.R. Sciacca, S.R. Bergmann, D.K. Blood, D.L. King. *Columbia University, New York, NY, USA*

Left ventricular volume and ejection fraction are important cardiac prognostic factors. Our objective was to compare absolute left ventricular volumes and ejection fractions by gated SPECT thallium with corresponding measurements by 3D echocardiography. Eighteen consecutive patients, referred for clinically indicated stress thallium scintigraphy (11 m, 9f age 35–78), underwent post-stress gated thallium scintigraphy using an ADAC 2-headed camera equipped with LEGP collimators. SPECT LVEF, end-diastolic volume (EDV) and end-systolic volumes (ESV) were determined using commercially available software (QGS, Cedars Sinai Medical Center). 3D echocardiography was performed immediately after the thallium studies. LVEF, EDV and ESV by 3D echo were determined using a validated polyhedral surface reconstruction algorithm. Measurements by the two techniques were compared using linear regression analysis.

| | EDV (range) ml | ESV (range) ml | EF (range) % |
|---|---|---|---|
| SPECT | 109 ± 97 (43–438) | 67 ± 91 (9–373) | 52 ± 18 (15–80) |
| 3D ECHO | 99 ± 81 (35–372) | 64 ± 68 (17–311) | 48 ± 13 (16–63) |
| r | 0.94 | 0.97 | 0.8 |
| p | 0.0001 | 0.0001 | 0.0001 |

*Conclusion:* Gated SPECT thallium LVEF and absolute volumes correlate with corresponding measurements by 3D echo. This enhances the clinical utility of thallium scintigraphy in the management of heart disease.

5:15

## 824-6 Long Term Follow-up of Patients With a Normal Dobutamine Stress Thallium Test

G.T. Schuyler, G.H. Hendrix. *Division of Cardiology, Medical University of South Carolina, Charleston, SC, USA*

*Background:* Dobutamine is a commonly used pharmacological stress agent for perfusion imaging. The sensitivity for the detection of at least a 50% coronary artery stenosis in our experience is 97%. However, the specificity is difficult to obtain because patients with normal studies rarely have cardiac catheterization and therefore, coronary arteriography is not available.

*Methods:* 630 patients who had normal stress thallium imaging were contacted. Data from the 477 respondents was analyzed for the incidence of death, MI, unstable angina, angioplasty, or coronary bypass surgery. Confirmation of positive responses was obtained from medical records or correspondence with the treating physician.

*Results:* There was a 1.2% incidence of MI and 1.7% incidence of cardiac related death in the 2 year follow-up period.

| | |
|---|---|
| Myocardial Infarction | 6 (1.2%) |
| Unstable Angina | 0 |
| PTCA | 0 |
| CABG surgery | 0 |
| Cardiac related deaths | 8 (1.7%) |
| Non-cardiac related deaths | 46 (9%) |

*Conclusion:* We conclude that a normal dobutamine stress thallium test is an indicator of an excellent prognosis with a long term history related to cardiac events equal to that of a normal coronary arteriogram.

# 825 Clinical Studies of Vascular Dynamics

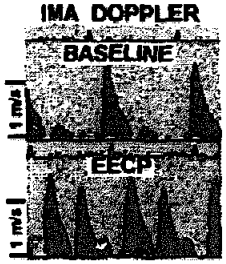
**Monday, March 30, 1998, 4:00 p.m.–5:30 p.m.**
**Georgia World Congress Center, Room 255W**

4:00

## 825-1 Effects of Enhanced External Counterpulsation on Internal Mammary Artery Flow: Comparison With Intraaortic Balloon Counterpulsation

W.E. Katz, V. Gulati, A.M. Feldman, L. Crawford, M. Peron, O. Soran, J. Gorcsan, III. *University of Pittsburgh, Pittsburgh, PA, USA*

Enhanced external counterpulsation (EECP) is a novel noninvasive treatment for refractory angina consisting of diastolic gated sequential leg compression. However, the therapeutic mechanism of EECP is unclear. A known effect of intraaortic balloon counterpulsation (IABP) is augmentation of diastolic coronary artery flow. To test the hypothesis that EECP augments diastolic arterial flow in a manner similar to IABP, 13 pts. had flow studies of internal mammary arteries (IMA), a preferred conduit for coronary bypass. Transthoracic Doppler measures of IMA flow velocities (7.5 MHz probe) were recorded at baseline and 1:1 inflations of EECP (n = 6) (example shown) and IABP (n = 7. Peak diastolic (D) velocities (cm/sec) and time velocity integrals (TVI) (cm) are shown (*$p < 0.0001$ vs. baseline).




| | EECP Group | | IABP Group | |
|---|---|---|---|---|
| IMA DOPPLER: | D | D-TVI | D | D-TVI |
| Baseline | 18 ± 6 | 6 ± 4 | 20 ± 10 | 6 ± 6 |
| Counterpulsation | 98 ± 21* | 19 ± 3* | 95 ± 21* | 15 ± 7* |

*Conclusion:* Noninvasive EECP produces significant augmentation of diastolic IMA flow comparable to increases induced by IABP. Augmentation of coronary artery flow similar to IABP may be a therapeutic effect of EECP for ischemic disease.

4:15

## 825-2 Imbalance Between Basal and Insulin-stimulated Endothelin Release, Nitric Oxide Release and Muscle Glucose Metabolism in Patients With Syndrome X

G. Fragasso, P. Piatti, L. Monti, A.E. Pontiroli, G. Pozza, S.L. Chierchia. *IRCCS H San Raffaele, Milano, Italy*

*Background:* We test the hypothesis whether an imbalance between endothelin-1 (ET-1) and nitric oxide (NO) release might be correlated to a decrease in muscle glucose metabolism in subjects with angina pectoris, positive exercise test and angiographically smooth coronary arteries (Syndrome X: Sx). Previous studies have found higher ET-1 levels and impaired endothelium activity and glucose metabolism in these subjects.

*Methods:* Nine subjects with Sx and 11 controls (C) normal subjects matched for age and body mass index (BMI) underwent an acute intravenous insulin bolus (0.1 U/kg) combined with a euglycemic clamp and forearm indirect calorimetry. ET-1, NO, glucose oxidation, glucose storage

MONDAY ORAL